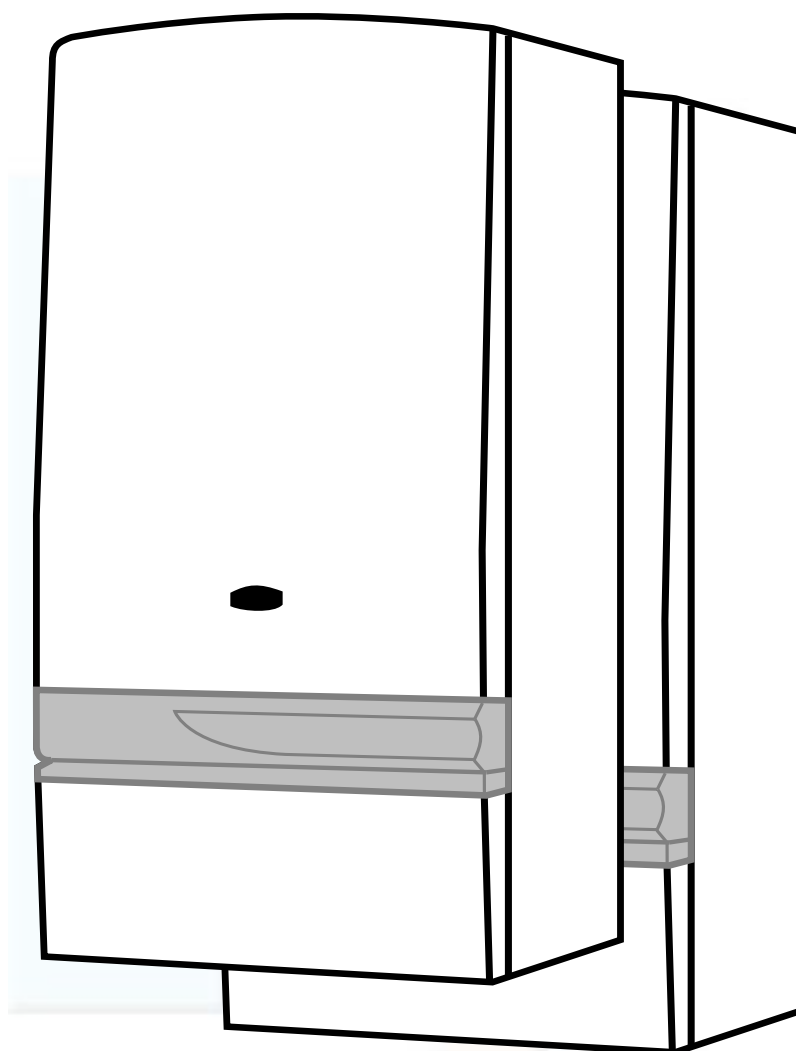


THELIA

Servicing instructions



THIS IS A CAT II2H3+ APPLIANCE

IN WARRANTY

TECHNICAL HELPLINE

01773 828400

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Saunier Duval

SERVICING INSTRUCTIONS

THELIA 23, THELIA 23 E, THELIA SB 23

Note!

The boiler serial number is marked on the label attached to the inside of the control cover. When ordering spare parts, please quote the part number and description, stating the appliance model and serial number from the data badge.

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ROUTINE CLEANING AND INSPECTION

To ensure the continued efficient and safe operation of the boiler, it is recommended that it is checked and serviced at regular intervals. The frequency of servicing will depend upon the particular installation conditions and usage, but in general once a year, at the end of the heating season should be enough.

It is the law that any servicing is carried out by a competent person.

Service check and preparation

- Operate the boiler and check for any faults that need to be put right.
- Isolate the boiler from the gas and electrical supplies.
- On completion, check all gas carrying parts for soundness with a leak detection fluid.
- The maximum domestic hot water flow rate is 11 litres/minute.
- Remove the boiler casing as follows:

Lower front control panel

- Open the control cover door by pulling it free from the magnetic catches at the top.
- Using a flat bladed screwdriver, disengage the two "quarter turn" fasteners at the top of the panel by turning the screws a quarter of a turn towards the centre of the boiler, **see diagram 1**.

Note : The lower panel must be opened before the upper front panel can be removed.

Upper front panel

- Turn the two plastic catches to release the panel and ease the bottom of the panel forward, **see diagram 2**.
- Carefully release the plastic case restraining strap from the spigot at the top of the boiler.

Side panels

Note : Side panels may be removed without first removing the front panels.

- Remove the panel retaining screw from the underside of the boiler.
- Pull bottom edge of panel from boiler frame.
- Lift panel upwards and off the two retaining lugs at the top of the boiler, **see diagram 3**.

Diagram. 1



Diagram. 2

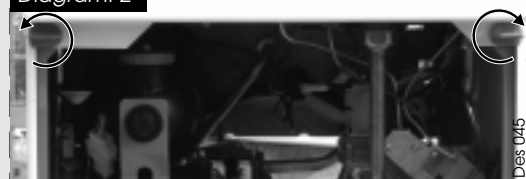


Diagram. 3



ROUTINE CLEANING AND INSPECTION

Combustion chamber

- Loosen the two wing nuts on the combustion chamber retaining rods, either side of the combustion chamber cover.
- Disengage retaining lugs from holes in either side of combustion chamber and move the retaining rods away to clear combustion chamber sides, **see diagram 4.**
- Unclip the toggle clips holding the upper part of the combustion chamber in place.
- Holding both sides, gently pull chamber forward to release it from the underside of the heat exchanger and out of the boiler.
- Take care not to damage the insulating material attached to the internal faces of the combustion chamber.

Cleaning of burner and pilot - Thelia 23 and Thelia SB23 only.

- Pull back pilot burner tube retaining clip and remove pilot burner tube, complete with electrode, by lifting upwards, **see diagram 5.** Inspect and clean if necessary by blowing through the tube.
- Unclip thermocouple and disengage from pilot assembly by pulling downwards and through sealing grommet in bottom of sealed chamber.
- Unscrew small nut connecting pilot supply pipe to pilot injector body.
- Carefully remove supply pipe by easing it downwards.
- Undo two screws and separate pilot assembly from burner.

Thelia 23E only - Remove the ignition and flame sense electrode.

Thelia 23E only - Undo the main gas supply nut connecting the gas safety solenoid to the main burner.

- Undo the main gas supply nut from the main burner.
- Undo and remove the three screws fastening the triangular retaining plate to the front face of the multi-functional control.
- Pull pipe forward to disengage from the multi-functional control then pull down to disengage from the main burner.

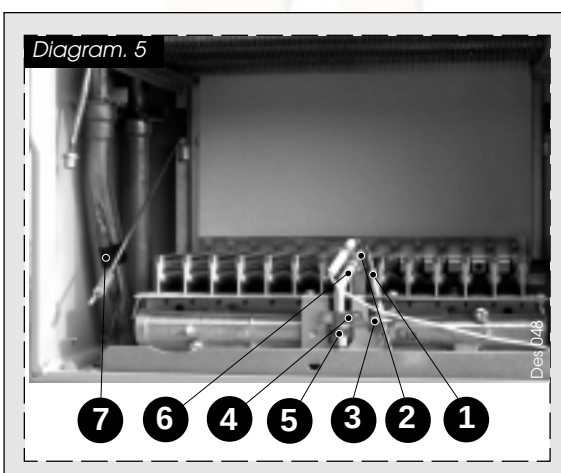
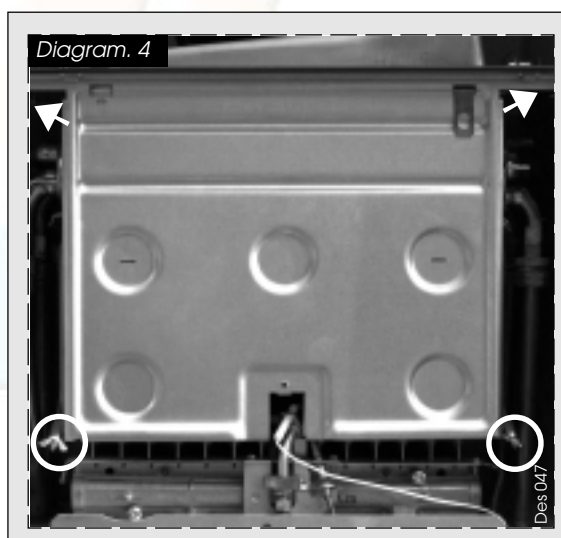
Note : The "O" ring seal behind the triangular plate and the seal at the gas supply nut on the burner must be kept for use on reassembly.

- Unscrew and remove the locking nut from both the main gas connection and burner pressure test point.
- Lift front edge of burner until gas pressure tapping and main gas supply tapping is free.
- Remove burner from boiler.
- Unscrew and remove the two injector bar retaining screws and separate injector bar from burner.

- Examine and clean injectors if necessary. Do not use a wire or sharp instrument on the holes.
- Unscrew and remove small injector retaining nut from injector tube.
- Examine pilot injector and clean if necessary. Do not use a wire or sharp instrument on the hole.
- Refit injector and retaining nut to pilot injector assembly. Do not overtighten nut.

Heat exchanger

- Disconnect power supply and earth leads from fan.
- Unscrew and remove the two fan retaining screws located at the front edge of fan mounting plate.



- 1 - Thermocouple
- 2 - Pilot burner
- 3 - Thermocouple retaining clip
- 4 - Pilot burner clip
- 5 - Pilot injector
- 6 - Pilot injector tube
- 7 - Thermostat bulb clip

ROUTINE CLEANING AND INSPECTION

- Remove fan with mounting plate attached by pulling forward and out of boiler. For top outlet flue system it will be necessary to turn the fan slightly during removal.
 - Unscrew and remove the two screws securing the flue hood to the boiler frame, **see diagram 4**.
 - Withdraw the flue hood from the boiler.
 - Examine heat exchanger for any blockages or build up of deposits.
- Clean heat exchanger with a soft brush or vacuum cleaner.

Reassembly of parts removed for servicing

All parts are replaced in reverse order to removal.

Flue system

- Check externally to make sure the flue is not blocked.
- Inspect flue system to make sure that all fittings are secure.

Operation of fan - Thelia 23 and Thelia SB23 only.

- Switch on electrical supply and turn on gas.
- Set selector lever to left hand position and light pilot, see Instructions for Use.
- With the pilot lit, check that the fan operates.
- Light the burner by opening a hot water tap.
- Without the upper front panel in place, the burner should be automatically prevented from lighting by the air flow detection system.
- Refit upper front panel.
- Check that fan speed increases when burner lights and decreases when it goes out.

Operation of fan - Thelia 23E only.

- Switch on electrical supply and turn on gas.
- Set selector lever to left hand position.
- Push in and release the "ON" button, see 'Instructions for Use'.
- The fan should start.
- Without the upper front panel in place, the burner should be automatically prevented from lighting by the air flow detection system.
- Refit upper front panel.
- Check that fan starts when burner lights and stops when it goes out.

Flame supervision device - Thelia 23 and Thelia SB23 only.

- With the upper front panel removed, put the pilot flame out.
- The multi-functional control should shut within 60 seconds, indicated by a 'click'.

Cold water inlet filter

Drain down hot water circuit of boiler only, as follows :

- Close isolating valve (p) on cold water inlet connection on fixing jig, **see diagram 6**.

Note : This valve is closed when the slot is at right angles to the direction of flow.

- Open one or more hot water taps to drain boiler circuit.

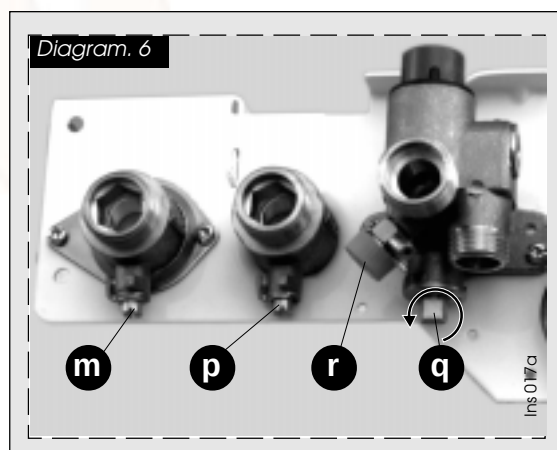
- Undo connecting nut from cold water inlet connection.

Note : Connecting pipework is telescopic, it may be necessary to slide sleeve back for easier access to filter.

- Clean and inspect filter, replace if necessary.
- With both flow restrictor and filter in place, re-connect connecting pipe to inlet connection and tighten.
- Fully open isolating valve on cold water inlet and check for water leaks.

Operation of water valve

- With selector lever in left hand, hot water only position, slowly open a convenient tap until boiler lights.
- Measure the flow rate of water, it should not be greater than 3.5 litres per minute.
- If necessary, replace the diaphragm.
- Finally, replace remaining outer panels.



REPLACEMENT OF PARTS

For replacement of the following components it will be necessary to remove the boiler casing panels as described in "Routine Cleaning and Inspection".

WARNING: Before commencing the replacement of any component, isolate appliance from electrical supply and turn off gas at service cock.

To replace thermocouple - Thelia 23 and Thelia SB23 only.

- Remove combustion chamber cover and pilot burner as described in "Routine Cleaning and Inspection".
- Disengage thermocouple from pilot assembly, refer to 'Routine Cleaning and Inspection'.
- Pull thermocouple downwards and through sealing grommet in bottom of sealed chamber.
- Unscrew thermocouple nut and disconnect thermocouple from thermocouple solenoid at rear of multi-functional control.
- Fit replacement thermocouple connecting nut to thermocouple solenoid first, making sure that the overheat thermostat connection is properly located in the solenoid of the multi-functional control.
- Push thermocouple head up through sealing grommet in bottom of sealed chamber. Correctly locate head in pilot burner bracket making sure thermocouple engages positively in the bracket.
- Replace pilot burner.
- Replace combustion chamber cover.
- Relight boiler pilot, check that when the "ON" button is released, once thermocouple tip is heated, the pilot remains alight.

To replace thermocouple solenoid

- Unscrew thermocouple nut from solenoid at rear of multi-functional control.
- Remove the overheat thermostat connector from the solenoid.
- Unscrew and remove thermocouple solenoid from the multi-functional control casting.
- Fit new solenoid and tighten.
- Reconnect thermocouple nut and tighten.
- Relight boiler pilot, check that when the 'ON' button is released, once thermocouple tip is heated, the pilot remains alight.

To replace domestic hot water thermistor - Thelia 23 and Thelia 23E only.

- Remove thermistor from domestic hot water outlet pipe by pulling off the retaining clip, **see diagram 7**.
- Disconnect the leads from the thermistor.
- Fit leads to the replacement thermistor and fit thermistor to domestic hot water outlet pipe in the position shown in **diagram 7**.
- No heat sink compound is necessary.

Diagram. 7



To replace microswitch assembly - Thelia 23 and 23E only.

- Disconnect microswitches by pulling off plugs from microswitch terminals, **see diagram 8**.
- Undo and remove screws holding microswitch assembly down onto reversing valve assembly, **see diagram 9**.
- Lift microswitch assembly away from reversing valve assembly.

CAUTION : Do not operate selector lever whilst microswitch assembly is removed from the top of the reversing valve, this ensures that link bar does not become disengaged from internal mechanism.

- Fit replacement microswitch assembly onto top of reversing valve, locating the two lugs on the rear edge, into the slots. Secure using fixing screws.
- Reconnect the two plugs making sure that the **GREY** plug is fitted to number 3 microswitch and that the **WHITE** plug is fitted to number 1 microswitch as marked on the top of the switch housing, **see diagram 8**.

Diagram. 8

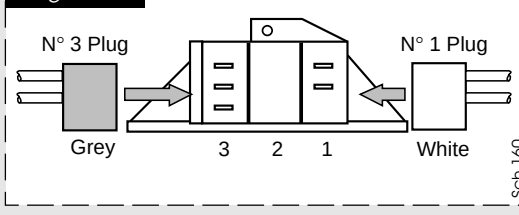


Diagram. 9



REPLACEMENT OF PARTS

To replace fan

- Disconnect power supply and earth leads to fan.
- Unscrew and remove the two fan retaining screws located at the front edge of fan mounting plate.
- Remove fan with mounting plate attached by pulling forward and out of boiler. For top outlet flue system it will be necessary to turn the fan slightly during removal.
- Remove original fan from mounting plate and secure new fan, making sure the plate is put on in the correct position.
- Fit replacement fan, complete with mounting plate, into the boiler in reverse order to removal.
- Make sure that mounting plate retaining lugs are correctly fitted onto rear edge of flue hood opening.
- Refit retaining screws.
- Reconnect power supply leads to either terminal and the earth lead to the earth tag on the motor.

Important :

- For top outlet flue, make sure that outlet of fan is correctly fitted into the flue elbow.
- For back outlet flue, make sure that outlet of fan is correctly fitted into the rear flue elbow or direct rear flue.

To replace air pressure switch

- Locate air pressure switch, situated in upper left hand corner of sealed chamber.
- Carefully pull off tube from the left hand connection.
- Unclip the pressure switch from the bracket and remove.
- Disconnect switch by pulling leads from switch terminals.
- Fit leads to terminals of replacement switch, connect each lead as follows :

CLEAR terminal cover to terminal number 1
BLACK terminal cover to terminal number 2
RED terminal cover to terminal number 3

- Fit replacement switch into boiler by clipping it into retaining bracket.
- Reconnect tube to left hand connector (marked P1) ensuring it is securely pushed on.

To replace push-button box

Thelia 23E only - Disconnect the two plugs from the right hand side of the push-button box.

Thelia 23 and Thelia SB23 only - Disconnect the four plugs from the right hand side of the push-button box.

- Undo and remove screw holding push-button box to bottom plate of boiler.
- Undo and remove screw holding push-button box to front of multi-functional control.

- Remove push-button box by pulling it forwards and upwards, disengaging it from multi-functional control.
- Fit replacement push-button box into boiler locating it in the recess on the front of the multi-functional control, in reverse order to removal.

Note : The plugs are uniquely keyed to fit the correct socket on the push-button box.

To replace spark generator - Thelia 23 and Thelia SB23 only.

- Locate spark generator, above and to the right of the push-button box.
- Disconnect all four leads from spark generator.
- Remove the upper screw and lift the spark generator out of the lower bracket.
- Fit and secure replacement spark generator.
- Reconnect both power supply leads, earth lead and ignition lead to correct terminals as follows :

Power leads, GREY, to terminals 1 and 2.
Ignition lead, WHITE, to terminal 3;
Earth lead, BLACK, to terminal 4.

To replace spark generator - Thelia 23E only.

- Locate spark generator, above and to the right of the push-button box.
- Disconnect all four leads from spark generator.
- Remove both securing screws and lift off spark generator.
- Fit and secure replacement spark generator.
- Reconnect both power supply leads, ignition and flame sense leads to correct terminals as follows :

Power leads, BLACK, to upper left hand connectors.
Ignition and flame sense leads, WHITE, to terminals a and b.



REPLACEMENT OF PARTS

To replace printed circuit board (PCB)

- Open the control cover door by pulling it free from the magnetic catches at the top.
- Using a flat bladed screwdriver, disengage the two "quarter turn" fasteners at the top of the panel by turning the screws a quarter of a turn towards the centre of the boiler, **see diagram 1**.
- Undo and remove the screw securing the PCB cover to the lower front panel, **see diagram 10**.
- Open the PCB cover to gain access to the PCB, **see diagram 11**.
- Lift PCB out of its location and carefully pull off the PCB connections.
- Fit replacement PCB in reverse order to removal.

Note : Make sure that the PCB connections are pushed fully onto the replacement PCB and that the PCB is correctly fitted into the lower front panel.

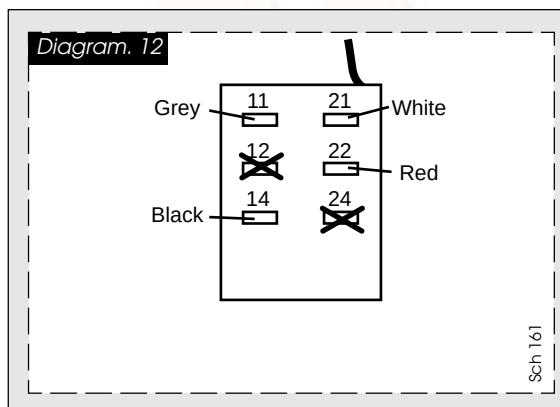
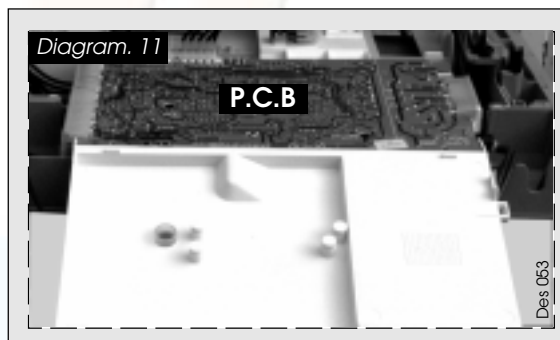
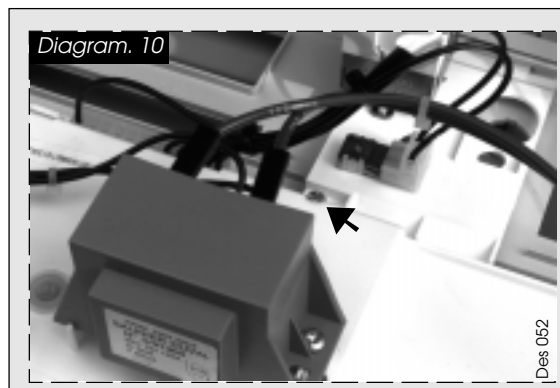
To replace central heating control thermostat

- Open lower front panel as described in previous section.
- Remove combustion chamber cover as described in 'Routine Cleaning and Inspection'.
- Unclip control thermostat sensing bulb from heating return pipe, **see diagram 5**.
- Push sensing bulb through grommet in bottom of sealed chamber.
- Note route of capillary for replacement.
- Remove the control thermostat knob.
- Remove the three screws securing the PCB housing/control thermostat mounting to lower front panel.
- Lift out the PCB housing/control thermostat mounting for access to the control thermostat.
- Disconnect wires from control thermostat.
- Undo the two screws and remove the control thermostat from its mounting.
- When fitting the replacement, carefully route the capillary to pass UNDER the temperature/pressure gauge and to the left hand side of the boiler.
- Attach the sensing bulb to the return pipe with clip, using the heat sink compound supplied.
- Refit thermostat and, other parts removed, in reverse order to removal.

Note : Make sure that the four leads to the replacement control thermostat are connected correctly, **see diagram 12**.

To replace domestic hot water temperature control - Thelia 23 and Thelia 23E only.

- Remove the domestic hot water temperature adjustment knob.
- Lift out the PCB housing/control thermostat



mounting as described in the previous section.

- Pull off the electrical connector from the adjustment potentiometer.
- Unscrew the nut securing the potentiometer to the housing.
- Replace the potentiometer and refit the electrical connector.
- Refit the parts in reverse order to removal.

REPLACEMENT OF PARTS

To replace pump

- Drain down the heating circuit of the boiler only, as follows:
- Close isolating valves on flow and return connections on fixing jig, **see diagram 6**.

Note : These valves are closed when the slots are at right angles to the direction of flow.

- Lift spindle on top of safety valve using a screwdriver to drain boiler, **see diagram 13**.
 - Complete draining by opening the drain valve knob anticlockwise and attaching a plastic tube to the drain outlet, **see diagram 6**.
 - Disconnect the pump electrical connection.
 - Remove the flat clip from the telescopic pump outlet connection and push the connection up to clear the pump body.
 - Undo the two fixing screws and remove the pump retaining bracket from front of pump.
 - Grasp pump body, lift upward to disengage pump inlet from reversing valve.
- When clear of reversing valve, slightly turn pump and remove pump from boiler by pulling forward and over reversing valve assembly.
- Throw away old pump inlet "O" ring.
 - Apply silicone grease to new "O" ring supplied and fit onto pump inlet connection at bottom of pump.

- Fit replacement pump into boiler in reverse order to removal.

Note : Apply silicone grease to pump outlet connection telescopic fitting prior to reconnecting to pump.

- Open isolating valves on flow and return connections, refill, vent and pressurise boiler.
- Check all joints for leaks.

To replace temperature/pressure gauge

- Drain down heating circuit of boiler only as described in the previous section.
- Undo and remove fixing screw holding gauge to front of reversing valve assembly.
- Remove gauge, pulling pressure probe tube from reversing valve and temperature probe from pocket on heating flow pipe.
- Apply heat sink compound supplied, to temperature probe of replacement gauge.
- Fit replacement gauge, carefully locating pressure probe tube in small hole in front of reversing valve and temperature probe in pocket of heating flow pipe.

Note : Always use new "O" ring supplied for pressure probe. Apply silicone grease to 'O' ring before assembly.

- Fit gauge fixing screw, taking care not to cross-

Diagram. 13



thread it in tapped hole in reversing valve front plate.

- Open isolating valves on flow and return connections, refill, vent and pressurise boiler.
- Check for leaks.

To replace reversing valve assembly

- Remove temperature/pressure gauge as described previously.
- Remove pump as described previously.

Thelia 23 and Thelia 23E only

- Remove microswitch assembly as described previously.

- Remove retaining clip from left hand pipe connection on front section of reversing valve and disengage pipe.
- Unscrew and disconnect heating flow (centre) connection at fixing jig.
- Remove retaining clip from heating flow pipe connection on right of front section of reversing valve.
- Remove heating flow pipe from boiler.
- Unscrew and disconnect heating return (left hand) connection at fixing jig.
- Remove retaining clip from expansion vessel pipe connection at rear of reversing valve assembly and disengage pipe.
- Push pipe back and out of reversing valve assembly.



REPLACEMENT OF PARTS

Thelia 23 and Thelia 23E only.

- Undo and remove large screw holding water valve to back plate of reversing valve assembly, see diagram 14.

Thelia 23 and Thelia 23E only.

- Push water valve back to disengage it from reversing valve assembly.
- Unclip and remove water pressure switch from left side of reversing valve assembly.
- From below boiler, undo and remove three screws holding reversing valve to bottom plate of boiler. Remove complete reversing valve assembly from boiler.
- Undo hose clip and remove heating return connecting pipe and hose from rear of reversing valve assembly. Fit hose to replacement reversing valve assembly using hose clip.
- Fit replacement reversing valve into boiler in reverse order to removal.
- Use new "O" rings, retaining clip, filter and washer supplied.

Thelia 23 and Thelia 23E only.

- Unscrew and remove microswitch assembly from top of replacement reversing valve assembly to allow refitting of water valve.

Note : Fit expansion vessel pipe and water pressure switch to reversing valve assembly before pump, to ensure that it is correctly located. Apply silicone grease to all 'O' rings and hoses prior to assembly.

- Open isolating valves on flow and return connections, refill, vent and pressurise boiler.
- Check for leaks.

To replace reversing valve front section

- Remove temperature/pressure gauge as described previously.
- Remove pipe connections from either side of reversing valve front section as described previously.
- Set selector lever to left hand, hot water only position.
- From below boiler, undo and remove single screw holding reversing valve front plate to bottom plate of boiler.
- Undo and remove six screws holding front section to rear section of reversing valve, see diagram 15.
- Remove front plate, complete with pump bracket, and then front section from reversing valve, along with sealing gasket.
- Assemble pump bypass valve, supplied, and fit into hole in underside of replacement front section. Fit 'U' shaped retaining clip.

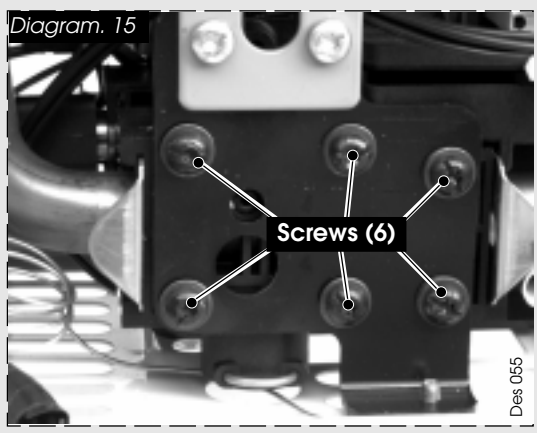
Note : Use bypass valve fitted to original front section for guidance.

- Fit replacement front section, with gasket, to rear

Diagram. 14



Diagram. 15



section of reversing valve.

- Locate front plate and replace six fixing screws. Take care to evenly tighten fixing screws and that they are not cross-threaded in tapped holes in reversing valve back plate.
- Refit pipe connections to either side of front section using new "O" rings, supplied.
- Apply silicone grease to "O" rings before fitting.
- Refit temperature/pressure gauge in reverse order to removal.
- Open isolating valves on flow and return connections, refill, vent and pressurise boiler.
- Check for leaks.

To replace reversing valve washers - Thelia 23 and Thelia 23 E only.

- Remove front section of reversing valve as described previously.
- Remove microswitch assembly from reversing valve assembly as described previously.
- Set selector lever to right hand, heating/hot water position.
- Carefully prise flat 'key' plate up and out of left hand crank and reversing valve shaft, see diagram 16.
- Through front of open reversing valve housing, pull reversing valve arm forward.
- Remove washers from two faces of reversing valve and fit replacement washers, pushing them over central retaining boss.

REPLACEMENT OF PARTS



- Push reversing valve arm back until slot in shaft aligns with slot in left hand crank in mechanism. Replace key plate in slot and push fully home. Set selector lever to left hand, hot water only position. Replace the microswitch assembly in reverse order to removal.
- Refit front section, with gasket, in reverse order to removal.
- Open isolating valves on flow and return connections, refill, vent and pressurise boiler.
- Check for leaks.

To replace water pressure switch

- Drain down heating circuit of boiler only as described in 'To replace pump'.

Note : It is not necessary to drain entire heating system to carry out this work.

- Pinch plastic cover to release retaining clips and remove cover from switch.
- Disconnect leads from switch by pulling off plug from terminals.
- Remove retaining clip holding switch into left side of reversing valve assembly.
- Remove switch from reversing valve, by pulling out towards left.
- Fit replacement switch into reversing valve, using new "O" ring supplied. Apply silicone grease to "O" ring before fitting.
- Reconnect lead to switch terminals.

Note : Plug can only be fitted one way.

- Open isolating valves on flow and return connections, refill, vent and pressurise boiler.
- Check for leaks.

To replace water valve or diaphragm Thelia 23 and Thelia 23E only.

- Drain down hot water circuit of boiler only, as described in "Routine Cleaning and Inspection".
- Remove microswitch assembly as described previously.
- Unscrew connecting nut from cold water inlet connection, second from left on fixing jig, keep filter and flow regulator.

- Remove retaining clip holding connecting pipe in rear of water valve.
- From below boiler, grip the clip with long nosed pliers and remove by pulling downward.

Note : This connecting pipe is 'telescopic', it may be necessary to slide back brass sleeve to allow easier removal.

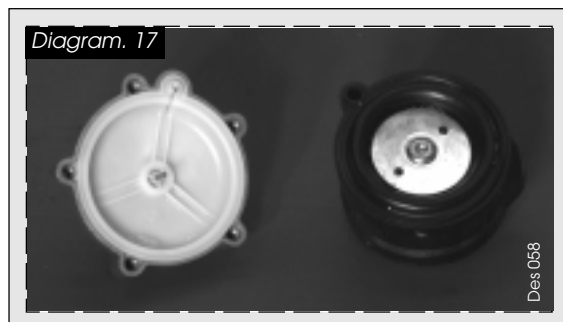
- Remove clip holding pipe to heat exchanger in rear of water valve.
- From below boiler, grip the clip with long nosed pliers and remove by pulling upward.
- Unscrew and remove large screw holding water valve to back plate of reversing valve assembly, **see diagram 14.**
- Push water valve back to disengage it from reversing valve and remove it from boiler.

Note : When disengaging water valve from heat exchanger pipe, check if small flow control device, fitted in water valve outlet, is not held on end of pipe. If so, carefully separate pipe from water valve to ensure that small spring and jumper do not fly out and are lost.

- To replace diaphragm, undo five screws and separate main components of water valve.
- If white diaphragm cover is to be replaced, separate original from water valve nose end casing and fit replacement cover.
- Fit replacement diaphragm, making sure that metal disc FACES diaphragm cover and beaded edge of diaphragm is correctly located in corresponding groove in both cover and plastic housing, **see diagram 17.**
- Reassemble water valve, taking care to evenly tighten five screws.
- Fit water valve actuating pin into hole in diaphragm cover, through nose end of valve, and push in until flush or slightly below nose end of water valve.

Note : Apply silicone grease to pin before fitting.

- Replace water valve in boiler, locating nose end into rear of reversing valve assembly, "springing" heat exchanger pipe to gain clearance as necessary. Fit large water valve retaining screw but do not fully tighten at this stage.



REPLACEMENT OF PARTS

- Apply silicone grease to "O" ring and fit onto end of heat exchanger pipe. Fit pipe into water valve by pulling it forward, make sure that "O" ring is correctly located.
- Whilst holding pipe in rear of water valve, fit retaining clip. This should easily clip over pipe and should not have to be forced. If resistance to fitting clip is experienced, either pipe is not correctly located in rear of water valve, or clip is not being correctly fitted through slot between back plate and plastic housing of water valve. When clip is fitted, check connection by pushing pipe back away from water valve.
- Refit telescopic connecting pipe to inlet of water valve after applying silicone grease to "O" ring. Fit retaining clip into groove on connecting pipe, through slot between back plate and plastic housing of water valve. Check connection by pulling pipe. Make sure that clip is not loose and likely to fall out at a later date. If in doubt, fit a new clip.
- With both flow regulator and plastic filter washer in place, refit connecting nut to inlet connection and tighten. Tighten water valve retaining screw. Open isolating valve on cold water inlet connection and check for water leaks..
- Replace microswitch assembly in reverse order to removal.

To replace multi-functional control

- Ensure that gas supply to boiler is turned off at gas cock.
- Remove push-button box as described previously.

Thelia 23 and Thelia SB23 only

Disconnect thermocouple from thermocouple solenoid as described previously.

Thelia 23 and Thelia SB23 only

- Undo two screws and remove pilot supply pipe retaining plate and gasket from front of multi-functional control. Carefully disengage pilot supply pipe from top of multi-functional control body by pulling upward and out of 'O' ring seal.
- Disconnect multi-functional control from wiring loom by pulling off two spade connectors (clear covers) on multi-functional control coil and disconnect earth lead from top of multi-functional control coil.

Thelia 23 and Thelia SB23 only

Undo the main gas supply pipe nut from the main burner. Undo and remove the three screws fastening the triangular plate to the front face of the multi-functional control.

Note : The gasket at the burner must be kept for use on reassembly.

- Pull pipe forward to disengage from multi-functional control then pull down to disengage from the main burner.

Thelia 23 E only

- Slacken, but do not remove, the three screws fastening the triangular plate to the gas safety solenoid. Undo and remove the three screws fastening the triangular plate to the front face of the multi-functional control. Pull pipe forward to disengage from multi-functional control then swing forwards to gain access to the multi-functional control.

- Undo main gas union nut, between multi-functional control and gas inlet valve, at right hand rear of boiler.

Thelia 23 E only

- Disconnect electrical connection from rear of multi-functional control.
- From below boiler, undo and remove two multi-functional control retaining screws. Withdraw multi-functional control from boiler, taking care not to lose the sealing washer.

Thelia 23 and Thelia SB23 only

- Unscrew and remove thermocouple solenoid from rear of multi-functional control. Fit thermocouple solenoid to replacement multi-functional control.
- Make sure that actuating pin, in multi-functional control inlet, is free to move.

Thelia 23E only

- Reconnect electrical connection to rear of multi-functional control.
- Fit replacement multi-functional control into boiler with sealing washer, engaging threaded inlet on to inlet valve. Do not tighten gas union nut at this stage.
- From below boiler, fit two multi-functional control retaining screws and tighten. Tighten main gas union nut.

Thelia 23 and Thelia SB23 only

- Undo two screws and remove pilot supply pipe retaining plate from front of replacement multi-functional control. Apply silicone grease to the smaller 'O' ring, supplied, and fit into pilot supply pipe connection in top of multi-functional control. Replace retaining plate and gasket with supply pipe passing through the 'forked' top of the plate. Fit and tighten retaining screws.
- Apply silicone grease to the larger 'O' ring, supplied, and fit into the pipe connection in front of multi-functional control. Refit main gas supply pipe. Tighten all retaining screws.
- Refit push-button box in reverse order to removal.
- Reconnect wiring loom spade connectors (clear covers) to multi-functional control.

REPLACEMENT OF PARTS

Thelia 23 and Thelia SB23 only

- Reconnect thermocouple to thermocouple solenoid.

To replace safety valve

- If safety valve seating is damaged it will be necessary to replace safety valve/heating flow connection.
- Drain down the entire heating system. From below boiler, disconnect heating flow pipe from rear of fixing jig.
- Remove temperature/pressure gauge as described previously.
- Undo heating flow connection on front of fixing jig. Remove retaining clip from heating flow pipe connection, on the right of front section of reversing valve. Pull pipe towards right and out of reversing valve. Remove pipe from boiler.
- From below boiler, disconnect safety valve discharge pipe.
- Working through the boiler from the front, undo and remove the screws holding safety valve assembly to fixing jig connecting plate.
- Remove complete safety valve assembly from connecting plate and withdraw from boiler.
- Fit replacement safety valve assembly. Fasten in place using fixing screws.
- Reconnect flow pipe to rear of jig and pipe between reversing valve and front of jig, using the sealing washers supplied.

Note : Apply silicone grease to 'O' ring before fixing pipe into right hand side of reversing valve.

- Replace temperature/pressure gauge in reverse order to removal.
- Refill heating system and boiler, vent and pressurise.
- Check for leaks.

To replace heat exchanger

- Drain down both heating and hot water circuits of boiler only, as described previously.

Note : It is not necessary to drain entire heating system to carry out this work.

- Remove combustion chamber cover, refer to "Routine Cleaning and Inspection".
- Remove retaining clip from left hand pipe connection on front section of reversing valve.
- Remove retaining clip from left hand rear heat exchanger connection. Disengage pipe by pulling downwards and off heat exchanger.
- Remove retaining clip from left hand front heat exchanger connection. Disengage pipe by pulling downwards and off heat exchanger.
- Unscrew and disconnect two heating connections to left side of heat exchanger.

Thelia 23 and Thelia 23E only.

- Unscrew and disconnect two hot water connections to right side of heat exchanger.

- Grasp both sides of heat exchanger, pull it forward on slide rails and out of boiler.
- Fit replacement heat exchanger into boiler. Locate outward facing flanges, one each side of heat exchanger, into slide rails. Push heat exchanger into boiler until connections line up.
- Reconnect heating and hot water connections, ensuring that sealing washers supplied, are fitted before refitting retaining clips and, on **Thelia 23 and Thelia 23E only**, before tightening nuts.
- Replace combustion chamber in reverse order to removal.
- Open isolating valves on flow and return connections, refill, vent and pressurise boiler.
- Check for leaks.

To replace fan resistor - Thelia 23 and Thelia SB23 only

- Locate fan resistor, mounted immediately beside air pressure switch in top left corner of boiler.
- Holding both ends of resistor, pull it forward to disengage it from retaining clip.
- Disconnect two leads. Remove resistor from boiler.
- Connect leads to replacement resistor. Each lead can be fitted to either terminal.
- Fit replacement resistor into boiler in reverse order to removal.

To replace expansion vessel

Boiler in place - The expansion vessel can be replaced with the boiler in place provided that a minimum clearance of 400mm exists on one side of the boiler and no vertical pipework passes between boiler and wall on that side.

- Drain down the heating circuit of the boiler as described previously.

Note : It is not necessary to drain the entire heating system to carry out this work.

- Remove pump from boiler as described previously.
- Unscrew pipe connection nut from expansion vessel connection, located at centre rear of boiler and disengage pipe from connection. Keep sealing washer.
- Remove back nut from expansion vessel connection. Remove cap from expansion vessel Schrader valve.
- Whilst supporting weight of expansion vessel, push bottom of expansion vessel away from boiler, disengaging threaded connection from hole in rear of boiler and allow it to drop out of two upper retaining brackets.
- Remove vessel to side of boiler with adequate clearance.
- Fit the replacement expansion vessel to the rear of the boiler in reverse order to removal



REPLACEMENT OF PARTS

ensuring that:

- The Schrader valve is located in the fork of the upper left retaining bracket.
- The sealing washer is fitted to expansion vessel pipe connection before tightening.
- Check that expansion vessel charge pressure is 1.0 bar (15.0 psi) using a pressure gauge. If necessary increase pressure using a car or cycle tyre pump connected to the Schrader valve.
- Open isolating valves on flow and return connections, refill, vent and pressurise boiler.
- Check for leaks.

Boiler removed from wall

If replacement of the expansion vessel is not possible with the boiler in place due to insufficient clearance, it will be necessary to remove the boiler from the wall. To do this proceed as follows:

- Drain down both heating and hot water circuits of boiler only, as described previously.

Note : It is not necessary to drain entire heating system to carry out this work.

- Ensure that gas supply to boiler is turned off at gas cock and that electrical supply is isolated.
 - Disconnect flue.
 - Unscrew and disconnect the five connections between fixing jig and boiler.
 - Disconnect the mains electrical lead from the supply.
 - Disconnect the external controls connection plug and socket on the fixing jig.
 - Disengage pipe connections. Lift boiler off fixing jig and place, face up, on a convenient work surface.
 - Remove expansion vessel from boiler as described in previous section.
 - Fit replacement expansion vessel and check charge pressure as described in previous section.
 - Replace boiler on fixing jig, tighten all connections, gas connection first, ensuring that all sealing washers, filters and the cold water flow restrictor are fitted before tightening.
- Reconnect flue making sure that all flue joints are properly connected.
- Open isolating valves on flow and return connections, refill, vent and pressurise boiler.
 - Check for leaks.
 - Reconnect all electrical connections to the boiler.
 - Restore electrical supply.
 - Open gas cock, operate boiler and re-check all joints for soundness.

To replace the gas safety solenoid - Thelia 23E only

- Ensure that gas supply to boiler is turned off at gas cock.
- Disconnect gas safety solenoid from wiring loom by pulling off two spade connectors (black covers) on gas safety solenoid.

- Undo and remove, the three screws fastening the triangular plate of the main gas supply pipe to the gas safety solenoid.
- Undo and remove the three screws fastening the triangular plate of the main gas supply pipe to the front face of the multi-functional control.
- Remove the main gas supply pipe.
- Holding the gas safety solenoid, undo the nut securing the solenoid to the main burner and withdraw from the boiler.

Note : The gasket at the burner must be kept for use on reassembly.

Fit replacement gas safety solenoid into boiler, engaging threaded outlet onto main burner gas union. Do not fully tighten gas union nut at this stage.

- Apply silicone grease to the 'O' rings supplied, and fit into the pipe connection in the front of multi-functional control and the side of gas safety solenoid.
- Refit the main gas supply pipe between the gas safety solenoid and the multi-functional control in reverse order to removal.
- Tighten gas safety solenoid union nut.
- Reconnect wiring loom spade connectors (black covers) to gas safety solenoid.

To replace overheat thermostat

- Locate the overheat thermostat on the heating flow pipe to the left side of the pump.
- Remove thermostat from heating flow pipe adjacent to pump by pulling off the retaining clip.
- Disconnect the two leads from the thermostat.
- Fit replacement thermostat to heating flow pipe using the heat sink compound supplied, locating the sensor part of the thermostat into the depression in the pipe.
- Reconnect the two leads, the polarity is not important.

To replace high limit thermostat

- Locate the high limit thermostat on the right hand side of the heat exchanger.
- Disconnect the two leads from the thermostat.
- Undo and remove the two fixing screws securing the thermostat to the heat exchanger.
- Fit replacement thermostat to heat exchanger using the heat sink compound supplied.
- Reconnect the two leads, the polarity is not important.

To replace combustion chamber insulation

Each of the four insulation panels lining the combustion chamber can be replaced as follows :
 Front section

- Remove combustion chamber from boiler as described in 'Routine Cleaning and Inspection'.
- To remove insulation panels, slide out of retaining lugs on combustion chamber sides.

REPLACEMENT OF PARTS

- Lift front insulation panel free from two retaining lugs and away from chamber.
- Fit replacement panels in reverse order to removal.

Rear panel

- Remove burner from boiler as described in "Routine Cleaning and Inspection".
- Carefully pull bottom edge of rear insulation panel forward, downward and out from behind heat exchanger. Remove insulation panel from boiler.
- Fit replacement panel in reverse order to removal.
- Replace burner into boiler in reverse order to removal.

To replace pilot assembly- Thelia 23 and Thelia SB23 only.

- Remove the combustion chamber as described in "Routine Cleaning and Inspection".
- Remove the pilot burner from the main burner as described in 'Routine Cleaning and Inspection'.
- Disconnect ignition and spark lead from spark generator.
- Remove pilot from boiler pulling ignition lead through sealing grommet in bottom of sealed chamber.
- Fit replacement pilot burner, complete with ignition electrode, in reverse order to removal.

To replace burner

- Remove burner as described in "Routine Cleaning and Inspection".

Thelia 23 and Thelia SB23 only

- Undo screw and remove pilot injector tube from burner injector bar bracket.
- Assemble replacement burner, supplied in parts, as follows :
 - Fit burner injectors to burner injector bar and tighten.

Note : Make sure that injector size, marked on each injector, is the same as that given in 'Technical Data' for the type of gas being used.

LPG Boilers only

- Fit injector shrouds to injectors.
 - Assemble burner elements (14), into front and rear burner supports, with securing pins and rods, using original burner for guidance.
 - Fit pilot burner to burner injector bar.
 - Fit burner injector bar to burner, secure using the two retaining screws.
- Fit replacement burner into boiler in reverse order to removal.

To replace pilot and burner injectors

- Remove burner as described in "Routine Cleaning and Inspection".
- Undo screw and remove pilot injector tube from burner injector bar bracket.
- Unscrew and remove pilot injector retaining nut from injector tube.
- Remove and replace injector, make sure that the size, marked on the injector, is the same as that given in "Technical Data" for the type of gas being used.
- Unscrew and remove the two injector bar retaining screws and separate injector bar from burner.

LPG Boilers only

- Remove the injector shrouds.
- Unscrew and remove the 14 injectors from the injector bar.
- Fit replacement injectors to burner injector bar and tighten.

LPG Boilers only

- Fit injector shrouds to injectors.

Note : Make sure that injector size, marked on each injector, is the same as that given in "Technical Data" for the type of gas being used.

- Re-assemble the burner and replace into boiler in reverse order to removal.

To replace digital timeclock

With lower front panel down, as described previously, undo and remove the screw securing the PCB cover to the lower front panel, **see diagram 10.**

- Open the PCB cover to gain access to the timeclock plug. Pull the plug off at the PCB.
- Carefully remove the timeclock by pushing it out of the moulded opening in the lower front panel.
- Fit replacement timeclock in reverse order to removal.

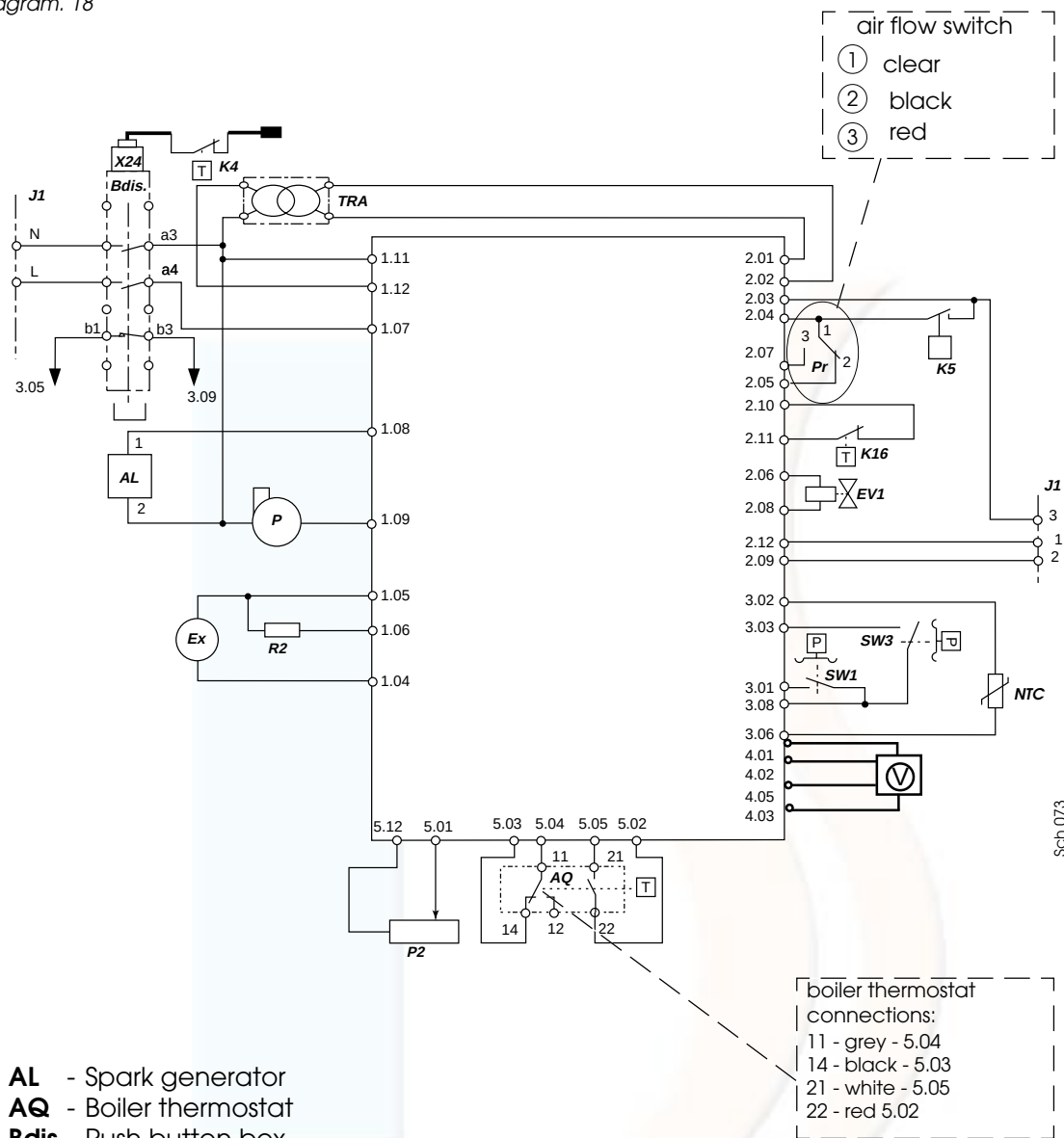
Note : If the digital timeclock has failed, it can be bypassed by disconnecting the plug at the PCB. The operation of the heating can then be controlled using the Summer/Winter lever.

This is a temporary measure until a replacement timeclock can be fitted.



THELIA 23 SCHEMATIC WIRING DIAGRAMS

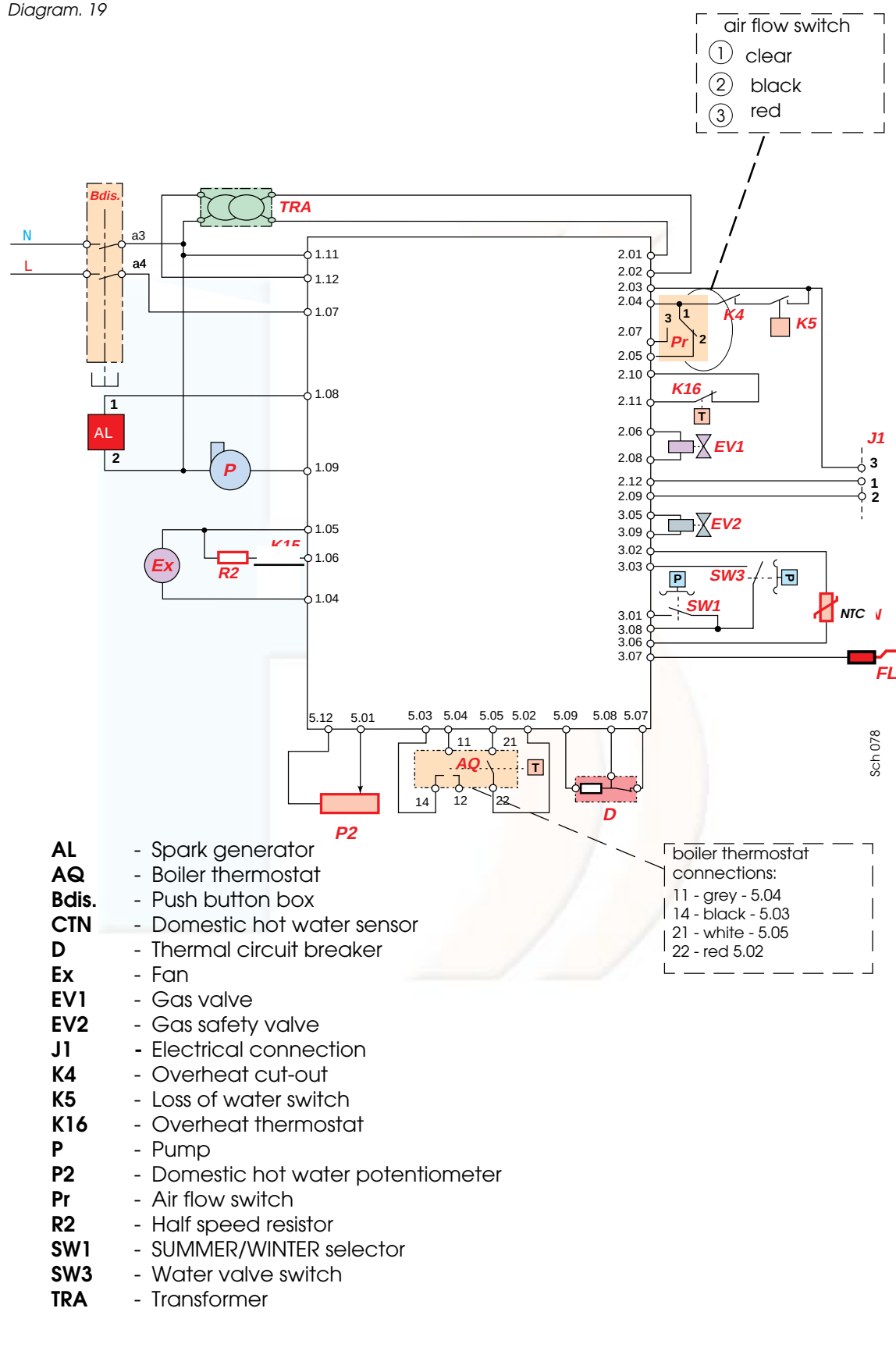
Diagram. 18



- AL** - Spark generator
- AQ** - Boiler thermostat
- Bdis.** - Push button box
- CTN** - Domestic hot water sensor
- Ex** - Fan
- EV1** - Gas valve
- J1** - Electrical connection
- K4** - Hi-limit thermostat
- K5** - Loss of water switch
- K16** - Overheat thermostat
- P** - Pump
- P2** - Domestic hot water potentiometer
- Pr** - Air flow switch
- R2** - Half speed resistor
- SW1** - SUMMER/WINTER selector
- SW3** - Water valve switch
- TRA** - Transformer
- X24** - Thermocouple connection

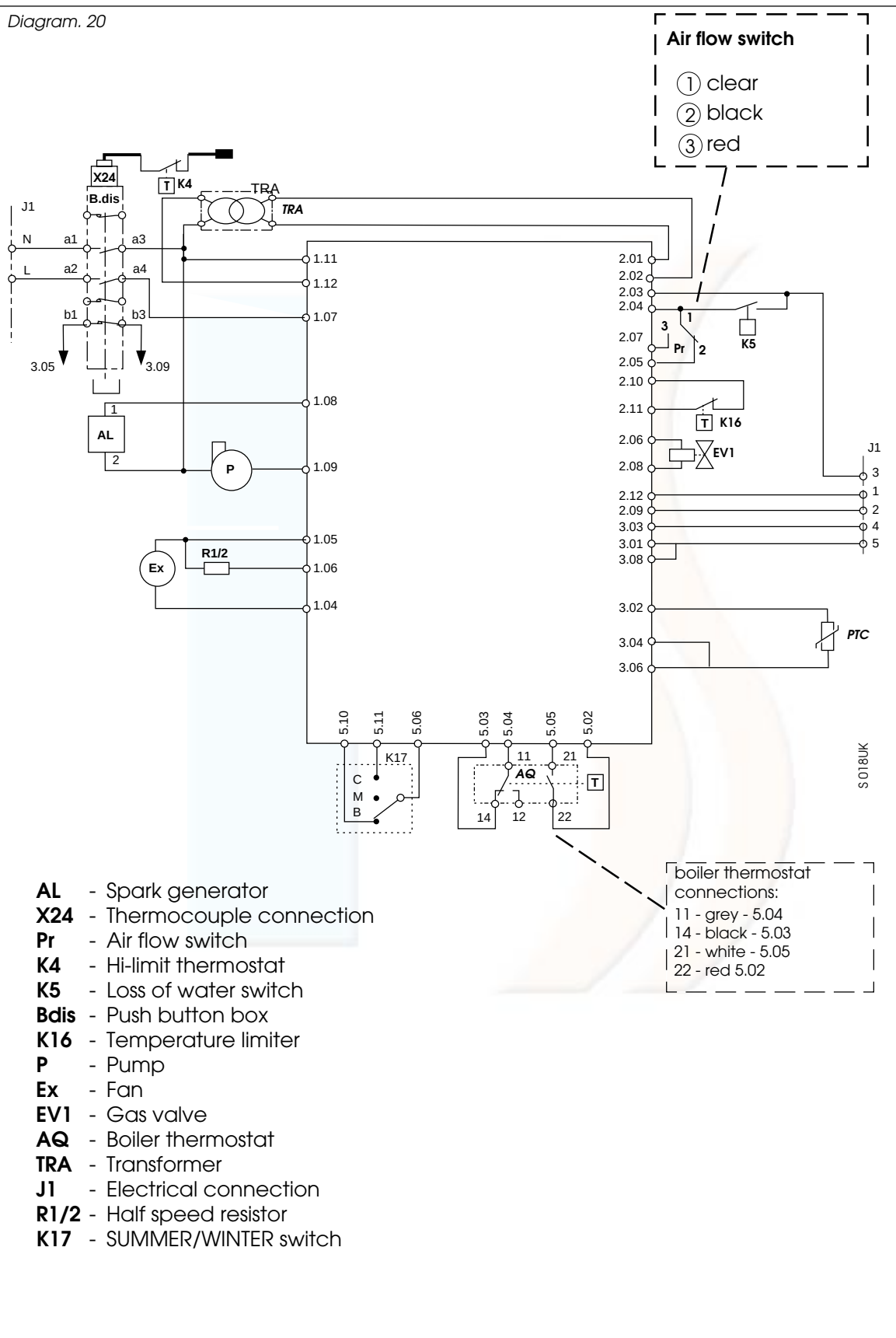
THELIA 23 E SCHEMATIC WIRING DIAGRAMS

Diagram. 19



THELIA SB 23 SCHEMATIC WIRING DIAGRAMS

Diagram. 20



FAULT FINDING

Before trying to operate the boiler make sure that :

- All gas supply cocks are open and that the gas supply has been purged of air.
- The heating system pressure is at least 1 bar.
- There is a permanent mains supply to the boiler.
- The fuse on the PCB is intact.

The fault finding charts will enable the majority of faults to be diagnosed. To use the charts effectively, it is necessary to determine exactly which aspects of the boiler are working correctly and which are not.

For example :

- If pilot cannot be lit refer to chart no. 1.
- If pilot is ok, the domestic hot water works correctly but the heating doesn't, refer to chart no. 2.
- If heating works correctly but the hot water doesn't, refer to chart no. 3.

IMPORTANT :Always adopt a logical step by step procedure starting at the beginning of the appropriate fault finding chart.

WARNING

- Always isolate the boiler from the electrical supply before carrying out any electrical replacement work.
- Always check for gas soundness after any service work.

Microswitch test procedure - Thelia 23 and Thelia 23E only

The two microswitches are housed in a plastic moulding located on top of the reversing valve and immediately to the right of the pump.

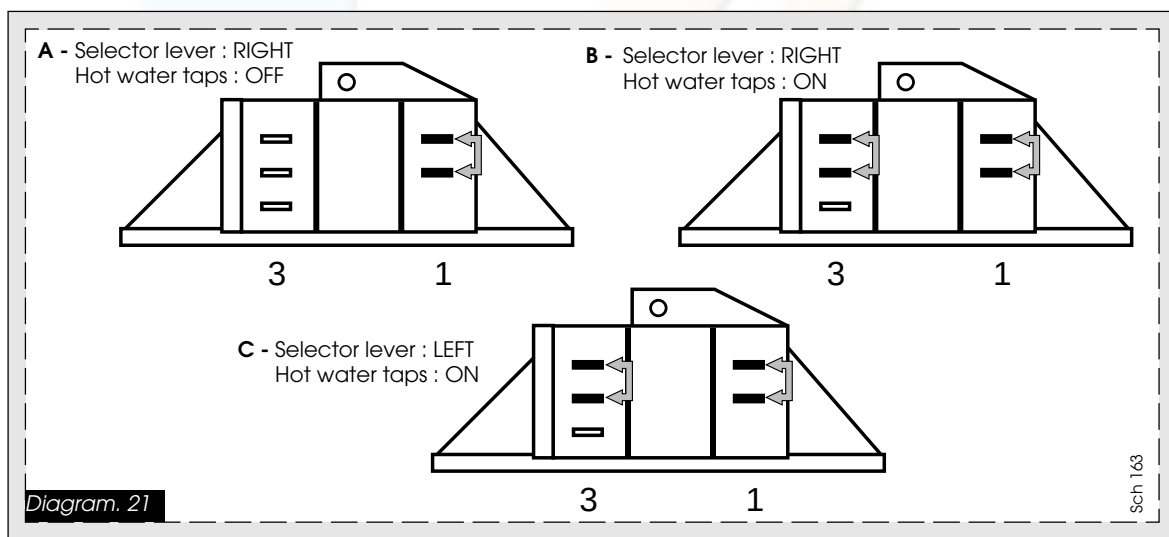
Switch 1 - Actuated, either by summer/winter lever (when put to right hand 'winter' position), or water valve diaphragm (when lever is in left hand 'summer' position). Switch MUST be closed for burner and pump to operate.

There is no switch 2.

Switch 3 - Actuated by water valve diaphragm when lever is in left or right hand position.

Testing

- Isolate boiler from electrical supply.
- Pull off both connections from microswitches 1 and 2.
- Check each switch for continuity or open circuit with selector lever in either right or left hand position and hot water tap either 'on' or 'off'.
- If continuity is as indicated in diagram 21, microswitches and water valve diaphragm are operating correctly.
- Operation of water valve diaphragm and microswitches should be checked at low water flow (about 3 litres/minute) as well as the maximum flow.



FAULT FINDING

THERMISTOR VALUES



temperature (°C)	nominal resistance (Ω) for NTC	nominal resistance (Ω) for PTC
0	32565	680
5	25345	785
10	19875	920
15	15700	1070
20	12500	1260
25	10000	1480
30	8060	1755
35	6535	2085
40	5330	2490
45	4370	2989
50	3605	3605
55	2989	4370
60	2490	5330
65	2085	6535
70	1755	8060
75	1480	10000
80	1260	12500
85	1070	15700
90	920	19875
95	785	25345
100	680	32565

FAULT FINDING

PILOT WILL NOT LIGHT - THELIA 23 AND THELIA SB 23 ONLY

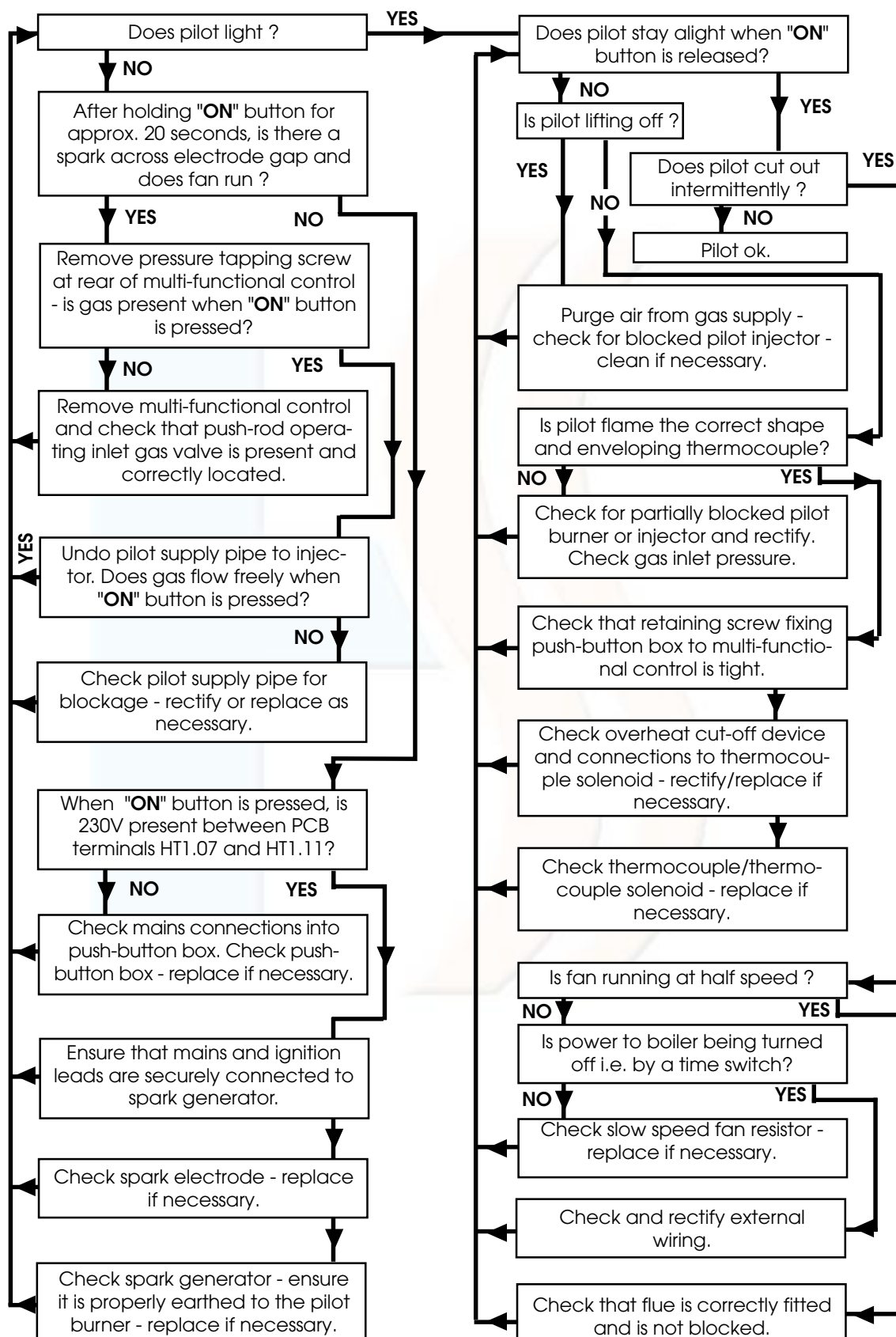


CHART N° 1

FAULT FINDING

NO CENTRAL HEATING

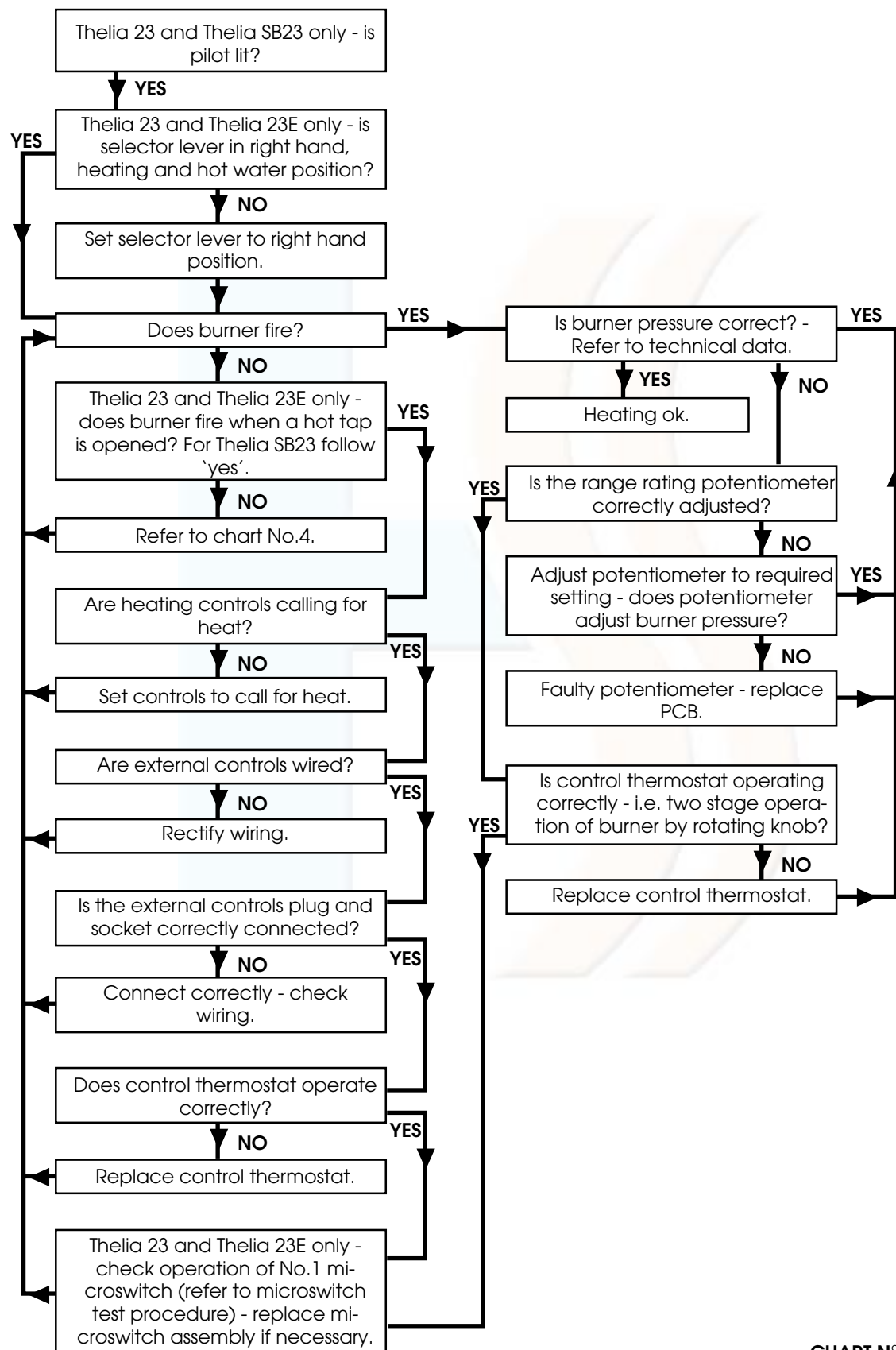


CHART N° 2

FAULT FINDING

NO DOMESTIC HOT WATER - THELIA 23 AND THELIA SB 23 ONLY

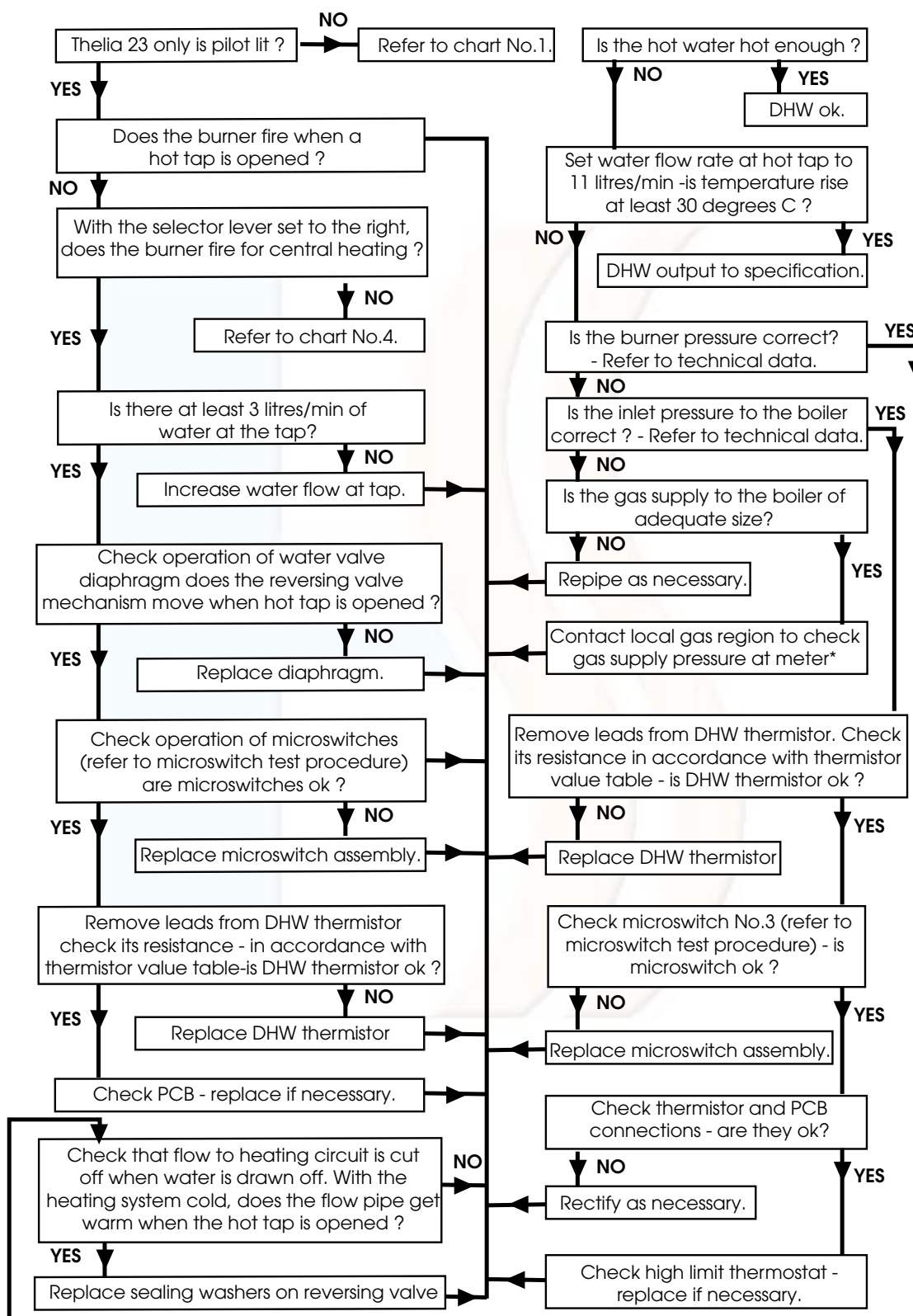


CHART N° 3

* **NOTE:** On LPG installations check that the gas storage/supply installation is of sufficient size to provide the required quantity of gas.



FAULT FINDING

BURNER WILL NOT FIRE (AFTER REFERRING TO CHART 2 OR 3)

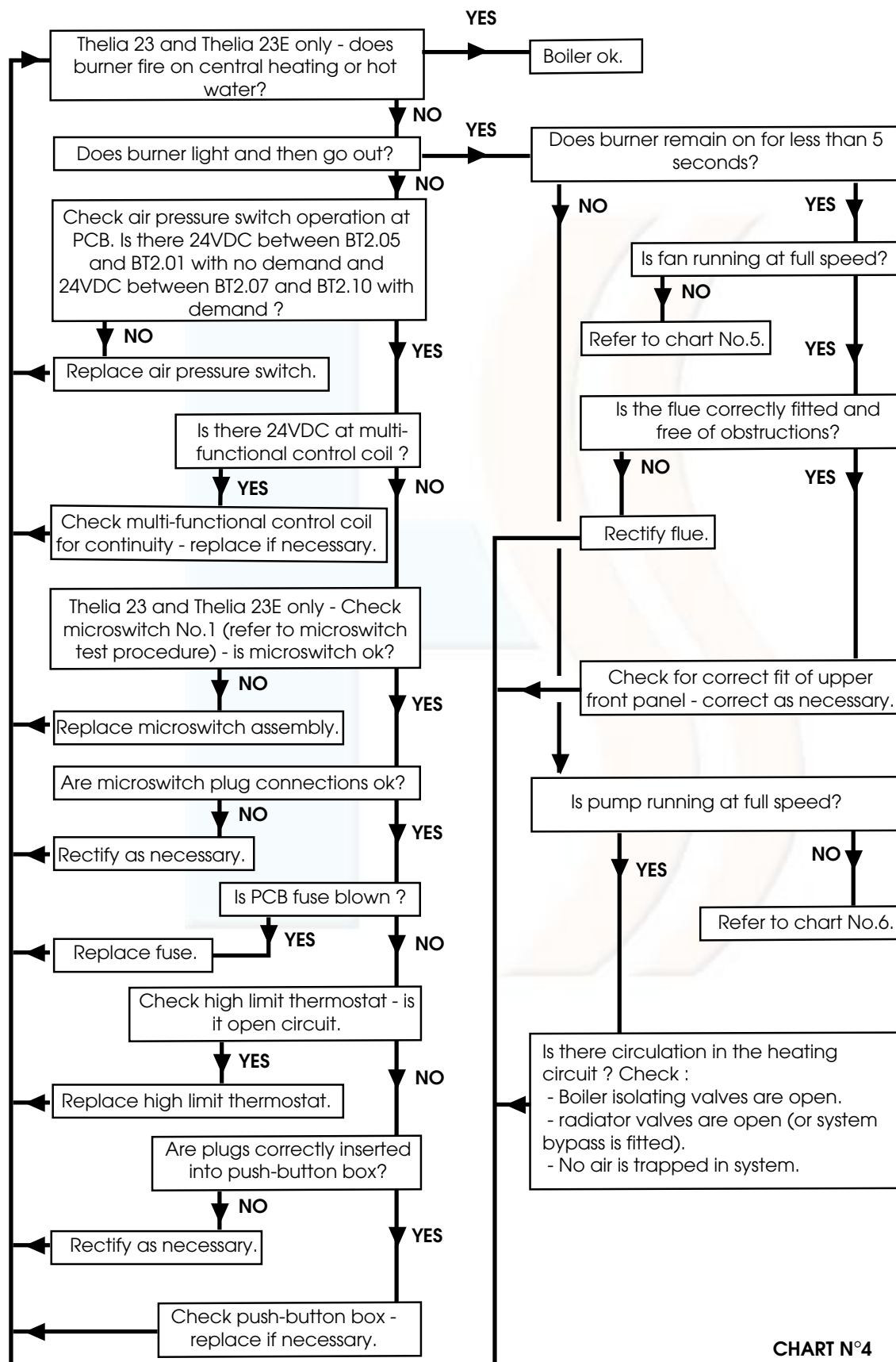


CHART N°4

FAULT FINDING

FAN NOT RUNNING

Before carrying out this fault finding, remove and refit plugs on PCB ensuring sound connections.

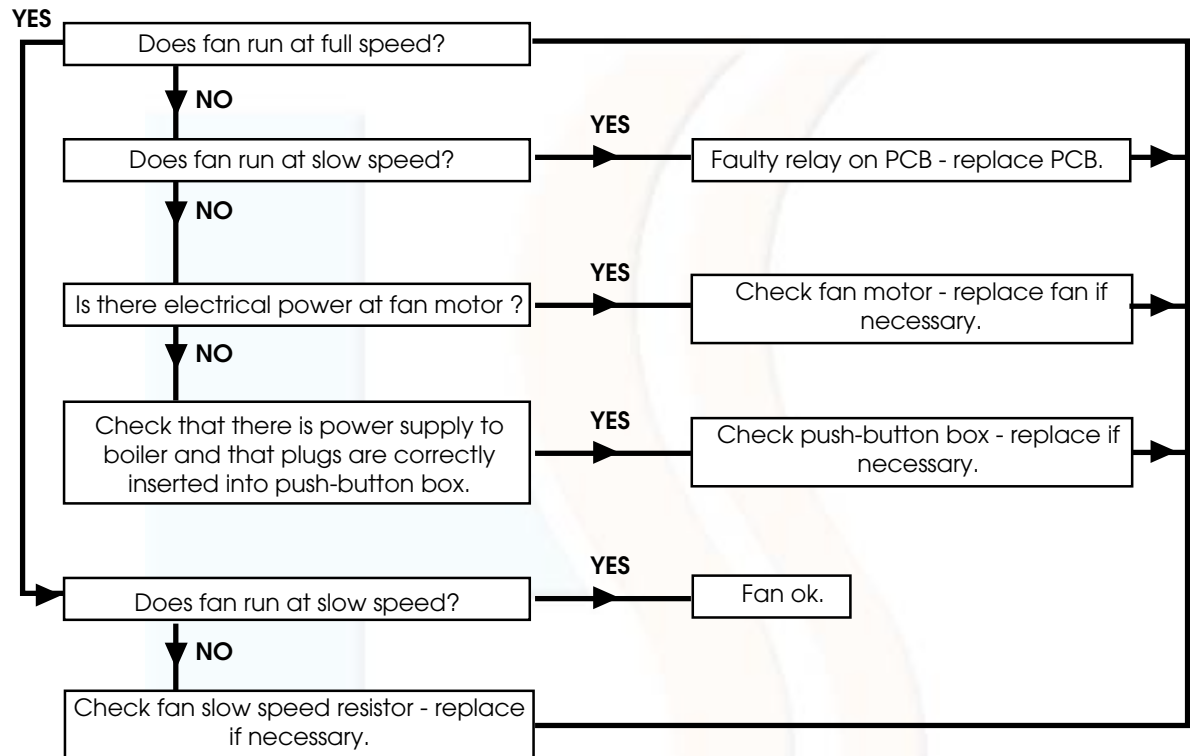


CHART N°5



FAULT FINDING

PUMP NOT RUNNING

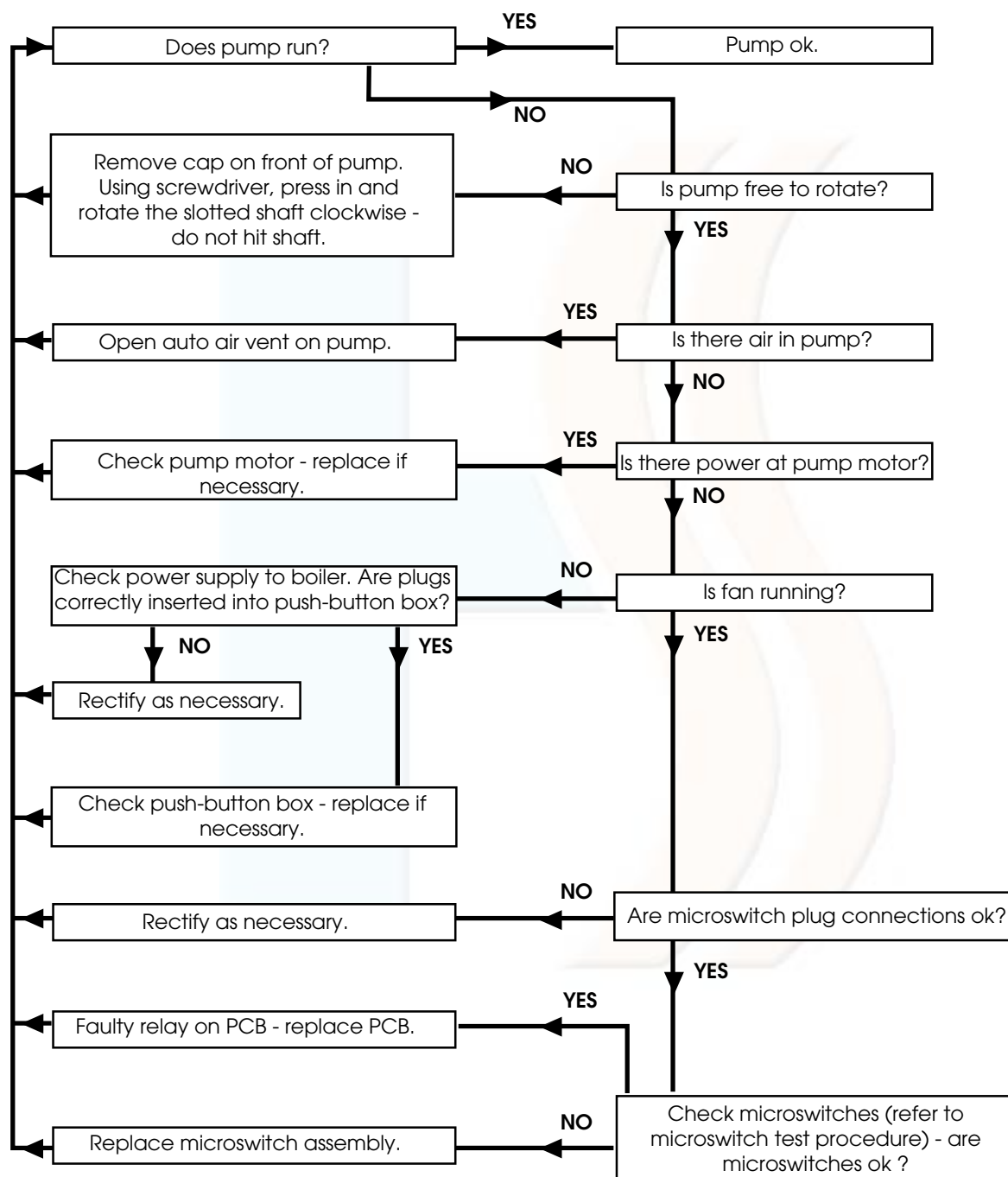


CHART N°6

SPARE PARTS

When ordering spare parts, quote the part number and description, stating the appliance model number and serial number from the data badge.

Short parts list

No.	Description	Part No.
1	Fan	57059
2	Pump	51236
3	Spark generator (Thelia 23/SB23)	52106
4	Spark generator (Thelia 23E)	52110
5	Control thermostat	57044
6	Air pressure switch	51692
7	Printed circuit board (Thelia 23)	57046
8	Printed circuit board (Thelia SB23)	57047
9	Printed circuit board (Thelia 23E)	57050
10	Water valve diaphragm kit	52519
11	Microswitch assembly (Thelia 23 and 23E)	51590
12	Temperature/pressure gauge	51342
13	Thermocouple (Thelia 23/SB23)	51444
14	Domestic hot water thermistor (Thelia 23/23E)	57042
15	High limit thermostat	51199



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